REMARKS

In the Office Action mailed January 13, 2005, the Examiner rejected Claims 1-16 under 35 U.S.C. § 102(e) or 35 U.S.C. § 103(a) based on U.S. Patent No. 5,990,928 to Sklar alone, and/or a combination of Sklar with U.S. Patent No. 6,166,686 to Lazar, and/or a combination of Sklar with U.S. Patent No. 5,764,185 to Fukushima and U.S. Patent No. 6,018,659 to Ayyagari, and/or a combination of Sklar, Fukushima, Ayyagari, and U.S. Patent No. 5,562,022 to Donahue. Applicant submits that all pending claims are allowable over the art.

Claim 1 is directed to a system for receiving broadcast satellite transmissions in a vehicle, comprising: an orientation system for determining an orientation of the vehicle in three dimensions, a controller which utilizes orientation data corresponding with said determined vehicle orientation and location data corresponding to a location of the vehicle relative to a predetermined positioning system (e.g. a GPS system) to determine position control data, and a one-dimensionally electronically pointable antenna mounted on a motorized turntable, wherein in open-loop operation the antenna is pointable in two dimensions in accordance with the position control data to receive a direct broadcast satellite signal. The system further includes a direct broadcast satellite receiver for processing a radio frequency signal corresponding with the direct broadcast satellite signal received by the electronically-pointable antenna, and a closed-loop feedback system to provide an output signal in response to the direct broadcast satellite signal received by the antenna, wherein in closed-loop operation the antenna is pointable in two dimensions utilizing the output signal to receive a direct broadcast satellite signal. The system also includes a signal lock for automatically activating and deactivating the closed-loop feedback system, wherein the system is in open-loop operation when the closed-loop feedback system is deactivated and in closed-loop operation when a closed-loop feedback system is activated.

The system of Claim 1 is low-cost due to the combinative utilization of a one-dimensional electronically-pointable antenna and a motorized turntable to achieve two-dimensional pointing. The system also yields enhanced signal receipt due to the combinative employment of (i) a signal lock and closed-loop feedback system for pointing the antenna during closed-loop operation, and (ii) the inclusion of an orientation system and controller for providing position control data to point the

antenna during open-loop operation (e.g. during start-up operation and/or periods when there is no signal lock). The prior art fails to anticipate or render obvious such an arrangement.

In particular, Sklar fails to disclose a one-dimensional electronically-pointable antenna, much less the combinative utilization of a one-dimensional electronically-pointable antenna mounted upon a motorized turntable to provide two-dimensional pointing. Rather, Sklar merely discloses using a "tracking antenna 38" (Column 3, Line 13, *et. seq.*) immediately after teaching that "the satellite antenna, which typically takes the form of a parabolic dish, must be pointed in the direction of the satellite" (Column 3, lines 10-12). In this regard, Applicant submits that Sklar teaches that <u>the dish</u> itself <u>must be pointed</u> and notes that nowhere does Sklar reference an "electronically-pointable antenna". Also, and as noted by the Examiner, Sklar fails to disclose a closed-loop feedback system. Furthermore, Sklar also falls far short of disclosing a system operable to use location data corresponding to a first location of a vehicle relative to a predetermined positioning system to determine position control data in open-loop operation (i.e. when a closed-loop feedback system is deactivated), wherein the system is also operable to use the closed-loop feedback system, in response to a first direct broadcast satellite signal when the closed-loop feedback system is activated.

Fukushima fails to disclose, *inter alia*, a system adapted to receive location data corresponding to a first location of a vehicle relative to a predetermined positioning system much less in combination with an electronically-pointable antenna. Furthermore, Applicant respectfully submits that <u>Fukushima does not disclose a signal lock for automatically activating and deactivating a closed-loop feedback system in response to said first direct broadcast satellite signal</u>. In particular, Applicant specifically points out that Fukushima does not disclose a signal lock for automatically <u>activating</u> a closed-loop feedback system in response to a first direct broadcast satellite signal. Rather, Fukushima teaches that:

> The angle accumulator 20 sequentially accumulates turning angles obtained by the angle calculator 15 and the thus obtained accumulated value is then compared with a given threshold by the accumulated angle judgment section 21. If the accumulated value from the angle accumulator 20 is higher than this threshold, the accumulated angled judgment section 21 commands the closed-loop controller 18 <u>to start closed-loop control</u>. The closed-loop controller 18 responds to the command for starting the

closed-loop control on the basis of a receiving signal level (emphasis added) (Column 6, lines 36-45).

In short, Fukushima discloses a system configured for activating a closed-loop feedback system on the basis of a signal from an angle accumulator (i.e. not in response to a broadcast signal), and the only system operation Fukushima discloses as being responsive to a received signal is the deactivation of a closed-loop feedback system (Column 6, Lines 60-67). While the closed-loop controller 18 disclosed by Fukushima performs closed-loop control "on the basis of a receiving signal level" (Column 6, Line 45), that is merely a description of how the control is performed. Again, the closed-loop controller 18 disclosed by Fukushima initiates its closed-loop control in response to a command generated by the angle accumulator, not in response to said first direct broadcast signal.

Applicant additionally notes that Fukushima actually teaches away from providing a signal lock for automatically activating and deactivating a closed-loop feedback system in response to a direct broadcast satellite signal (i.e. wherein the system is in open-loop operation when a closed-loop feedback system is deactivated) by providing a system in which an open-loop control continues during periods when a broadcast signal is blocked (Column 5, Lines 60-65; Column 6, Lines 1-7). Fukushima thereby teaches that open-loop control operates contemporaneously with closed-loop control because open-loop control continues when closed-loop control terminates via the signal being blocked.

Ayyagari fails to disclose, *inter alia*, a motorized turntable to provide two-dimensional pointing, much less in combination with a one dimensionally electronically-pointable antenna. Furthermore, Ayyagari fails to disclose a closed-loop feedback system, much less a signal lock for automatically activating and deactivating a closed-loop feedback system in response to said first direct broadcast satellite signal.

In addition to the respective shortcomings of Sklar, Fukushima, and Ayyagari, Applicant submits that Sklar fails to provide any suggestion or motivation to combine the teachings thereof with Ayyagari, or Fukushima, much less in a manner that would yield the invention of Claim 1. For example. Sklar does not suggest or provide any motivation to modify its tracking antennae so as to

an electronically-pointable antenna. Again, Sklar merely discloses using a tracking antenna 38 which "typically takes the form of a parabolic dish [that] must be pointed in the direction of the satellite" (Column 3, lines 10-12).

Applicant further submits that the Examiner has improperly speculated that a "known benefit of a simpler design" provides a basis to combine the teachings of Sklar with those of Ayyagari. In fact, Sklar does not suggest that there are other antennae that could simplify its design. Sklar discloses using a tracking antenna 38, and repeatedly discloses that the antenna design in the preferable embodiment is parabolic (Column 3, Lines 9-13; Column 5, Line 67; Column 6, Lines 1-4). A parabolic antenna focuses its collected radiation on its azimuth, whereas a non-parabolic dish does not necessarily have this feature. Sklar also repeatedly teaches that parabolic antennae are preferably used because satellite signals are "highly directional" (Column 3, Lines 9-13; Column 5, Line 67; Column 6, Lines 1-4). Sklar does not teach that there is a simpler design or that the use of parabolic antennae is sub-optimal. Furthermore, Applicant submits that the Examiner's assertion that Sklar's caveat that the antenna "may or may not be parabolic" (Column 3, Lines 13-14) means that any antenna is equally acceptable or that an electronically-pointable antennae should be included in such a group.

For the record, as general reference and particularly in reference to Examiner's assertion regarding "the known benefit of a simpler design," Applicant notes that it is clear that the prior art must teach or otherwise motivate a combination of prior art references. For example, in the CAFC decision of *In re Anita Dembiczak and Vincent Zinbarg, 175 F.3d 994, U.S.P.Q.2D (BNA) 1614 (Fed. Cir. 1999)* the Court stated:

> Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. See, e.g., *C.R. Bard, Inc. v. M3 Sys., Inc., 157 F.3d 1340, 1352, 48 U.S.P.Q.2D (BNA) 1225, 1232 (Fed. Cir. 1998)* (describing "teaching or suggestion or motivation [to combine]" as an "essential evidentiary component of an obviousness holding"); *In re Rouffet, 149 F.3d 1350, 1359, 47 U.S.P.Q.2D (BNA) 1453, 1459 (Fed. Cir. 1998)* ("the Board must identify specifically...the reasons one of ordinary skill in the art would have been motivated to select the references and combine them"); *In re Fritch, 972 F.2d 1260, 1265, 23 U.S.P.Q.2D (BNA) 1780, 1783 (Fed. Cir. 1992)* (examiner can satisfy burden of obviousness in light of combination "only by showing some objective teaching [leading to the

> combination]"); *In re Fine, 837 F.2d 1071, 1075, 5 U.S.P.Q.2D (BNA) 1596, 1600 (Fed. Cir. 1988)* (evidence of teaching or suggestion "essential" to avoid hindsight); *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297, 227 U.S.P.Q. (BNA) 657, 667 (Fed. Cir 1985)* (district court's conclusion of obviousness was error when it "did not elucidate any factual teachings, suggestions or incentives from this prior art that showed the propriety of combination"). See also *Graham, 383 U.S. at 18, 148 U.S.P.Q. (BNA) at 467* ("strict observance" of factual predicates to obviousness conclusion required). Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight. See, e.g., *Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1138, 227 U.S.P.Q. (BNA) 543, 547 (Fed. Cir. 1985)* ("The invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time."). In this case the Board fell into the hindsight trap.

Applicant respectfully submits that the Examiner's assertion regarding "the known benefit of a simpler design," is improper because, *inter alia*, it improperly uses Applicant's disclosure and therefore a hindsight-based obviousness analysis.

In addition to the foregoing, Applicant asserts that Sklar actually teaches away from an electronically-pointable antenna by emphasizing the use of a parabolic antenna in its preferred embodiment (Column 3, lines 10-12; Column 6, Lines 1-3), by referencing that the dish could be an 18-inch satellite dish (Column 1, Lines 40-41), by stating that "the receive antennae could be larger than 18 inches to improve link margin" (Column 13, Lines 24-25). In particular, Sklar teaches that, "satellite transmissions are highly directional. Thus, in order to receive a satellite signal, the satellite antenna, which typically takes the form of a parabolic dish, must be pointed in the direction of the satellite" (Column 3, lines 10-12; Column 6, Lines 1-3). Again, Sklar emphasizes numerous times that the tracking antenna 38 must be pointed in the direction of the satellite (Column 3, Lines 10-12, Lines 14-18 & Lines 26-28; Column 4, Lines 4-6; Column 6, Lines 1-8 & Lines 15-19; Column 8, Lines 45-52; Claim 1).

Further, Sklar does not provide a suggestion or motivation to combine its teachings with the teachings of Fukushima including, *inter alia*, a closed-loop feedback system, much less a signal lock for automatically activating and deactivating a closed-loop feedback system in response to a first direct broadcast satellite signal. Sklar teaches that:

> In operation, the antenna controller 46 continuously adjusts the pointing direction of the tracking antenna 38 so that it always points in the direction of a target satellite even thought the antenna 38 is in motion due to the flight of the aircraft 34 to which the antenna 38 is attached. The tracking antenna 38 is commanded by the antenna controller 46 to point to a particular set of coordinates in space that represent the location of the desired satellite, 24 or 28. These coordinates are preferably expressed in terms of azimuth and elevation relative to the aircraft's position and altitude in space, "pedestal azimuth" and "pedestal elevation". A rotation parameter may also be needed, depending upon the signal characteristics of the satellite system in use. The location and attitude of the aircraft 34 are provided by either the aircraft's INS system or a GPS antenna and receiver and are expressed in terms of aircraft longitude, latitude and altitude as well as roll, pitch and heading (Column 8, Lines 45-61).

Sklar thereby teaches away from a closed-loop feedback system by teaching that an aircraft's location relative to a predetermined positioning system is utilized *continuously* to create a pointing command to a particular set of coordinates in space. Further, Sklar teaches away from a signal lock for automatically activating and deactivating a closed-loop feedback system in response to a first direct broadcast satellite signal by teaching that its antenna controller operates continuously. Applicant again notes that Fukushima also fails to disclose a signal lock for automatically activating a closed-loop feedback system in response to a first direct broadcast satellite signal. Therefore, even if the teachings of Sklar were improperly combined with Fukushima, the combination would not teach a signal lock for automatically activating and deactivating a closed-loop feedback system in response to a first direct broadcast satellite signal.

In addition, Applicant submits that the teachings of Fukushima cannot be properly combined with Ayyagari because Fukushima teaches away from, *inter alia*, a system adapted to use a predetermined positioning system, by teaching a system adapted to use "an apparatus which is improved in tracking performance when the signal from the target is blocked" (Column 1, Lines 58-60). Fukushima further teaches "the antenna absolute direction will be maintained at a direction immediately before the blocking until the blocking is removed" (Column 3, Lines 14-16). The

system maintains the antenna absolute direction, and conditions this maintenance on the output of a rate sensor. Fukushima teaches:

> The motor driving circuit 11 controls the angular position of the beam by driving the motor 7 in response to the output of a rate sensor 13 which detects the angular rate of the moving body within the reference plane, the output thereof being then supplied to an error correction circuit 14 (Column 5, Lines 25-29).

Fukushima further teaches:

> The above-described open-loop control based on the output of the rate sensor 13 enables the provision of an apparatus less influenced by blocking. In general, there are two kinds of direction error, one of which is caused by the moving body turning, another of which is caused by the satellite movement relative to the moving body. If the blocking is short in duration, the latter is negligible. Accordingly, by performing the open-loop control such that the antenna direction relative to the satellite will be maintained despite the moving body turning, even if a signal from the target is blocked by any obstruction such as a building or the like, as long as it does not last a long time, the transceiver 2 can immediately re-start the transmission of signals between the antenna 10 and the target when such a blocking is removed (Column 5, Lines 60-65; Column 6, Lines 1-7).

Thus, Fukushima teaches away from a system adapted to use a predetermined positioning system during open-loop control by teaching an improvement in tracking performance by using a rate sensor during and by maintaining the antenna absolute direction as long as the blocking is short in duration and the direction error is negligible.

In view of the foregoing, Applicant submits that Claim 1 is allowable over the art. In addition, Applicant submits that Claim 11 is allowable over the art.

Claim 11 sets forth a system for receiving in a mobile craft transmissions from a direct broadcast satellite having a known location relative to a predetermined positioning system, said system comprising: an orientation system for determining a first orientation of the vehicle in three

dimensions and a processor, in communication with said orientation system, for determining position control data from said first orientation data corresponding to a first location of the mobile craft relative to said predetermined positioning system, wherein said processor is adapted to receive a first input from a user, said first input corresponding to selection of the first direct broadcast satellite. The system further comprises an electronically-pointable antenna, in communication with said processor, adapted to be pointed at the first direct broadcast satellite in accordance with said first position control data, wherein the first signal from the first direct broadcast satellite is receivable by said electronically-pointable antenna.

Applicant submits that Claim 11 is allowable over Sklar. Sklar fails to disclose, inter alia, a orientation system coupled with a processor adapted to receive a first input, that input corresponding with the selection of a first direct broadcast satellite, with the processor correspondinglycreating first position control data. Rather, Sklar discloses a tracking antenna 38 under the control of an antenna controller 46 that receives input from both an orientation system and a region control unit 44 that receives input from both an orientation system and switching/receiving/decoding system 42 that selects which satellite to point the antenna toward (Figure 2; Column 3, Lines 31-35; Column 9, Lines 53-67; Column 10, Lines 1-12). In short, Sklar discloses <u>a system operable to use an automated method of selecting a first direct broadcast satellite</u>. Sklar discloses a system that alerts a user or passenger of the effects of the selection, but does not disclose a method of incorporating a first user input with the actual selection of a first direct broadcast satellite (Figure 3; Column 10, Lines 13-67; Column 11, Lines 1-67; Column 12, Lines 1-67; Column 13, Lines 1-16). Further, Sklar fails to disclose a system adapted to use said first position control data to control an electronically-pointable antenna. Rather, Sklar discloses the use of a tracking antenna 38, "*which typically takes the form of a parabolic dish*" (Column 3, lines 10-12; Column 6, Lines 1-3). Applicant reiterates and incorporates by reference its above assertions that Sklar does not disclose and indeed teaches away from a system adapted to use an electronically-pointable antenna in Sklar's disclosure and teachings regarding the tracking antenna 38.

In view of the foregoing, Applicant submits that independent Claims 1 and 11 are in allowable form. Further, Applicant submits that Claims 2-10 and 12-16, which are dependant upon

Claims 1 and 11, respectively, are allowable for the same reasons as noted above in relation to Claim 1 and 11.

Based upon the foregoing, Applicant believes that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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